Dec. 16, 1924. 1,519,780

S. F. KLOHS

LOCOMOTIVE FRONT END

Filed Oct. 16, 1922 2 Sheets-Sheet 1

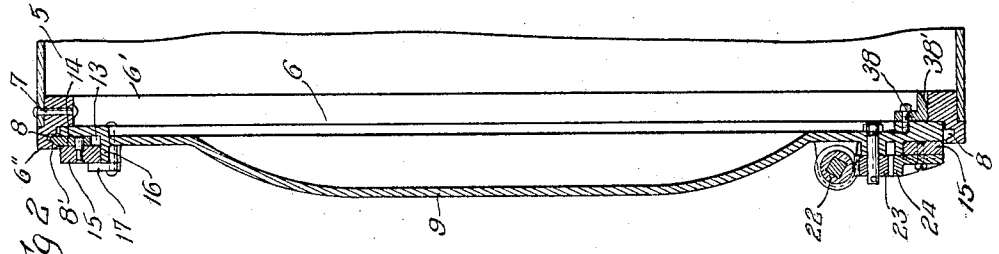


Fig 2

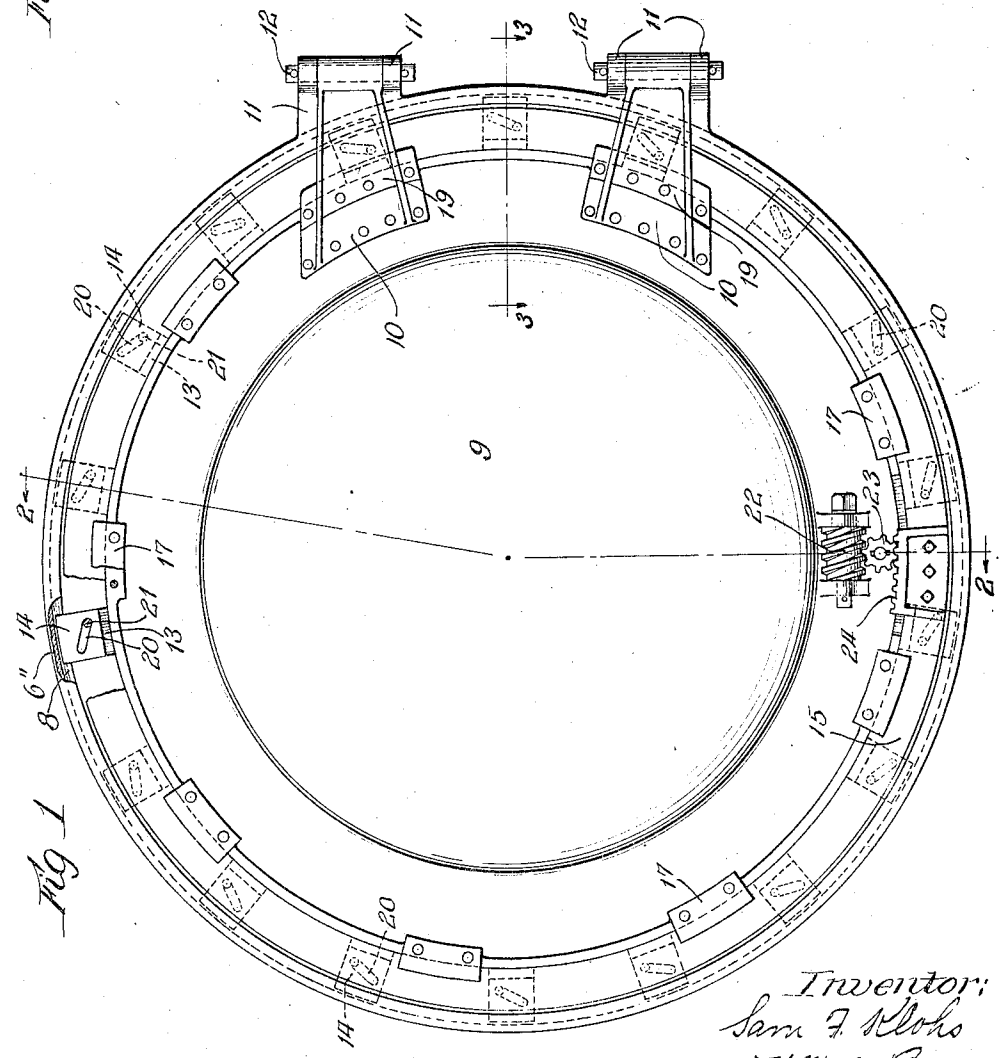


Fig 1

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Fig 3

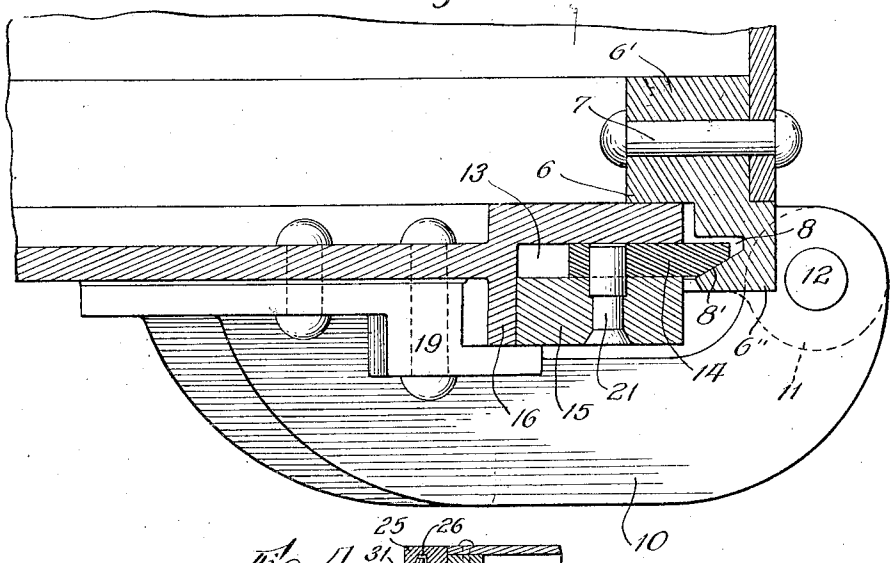
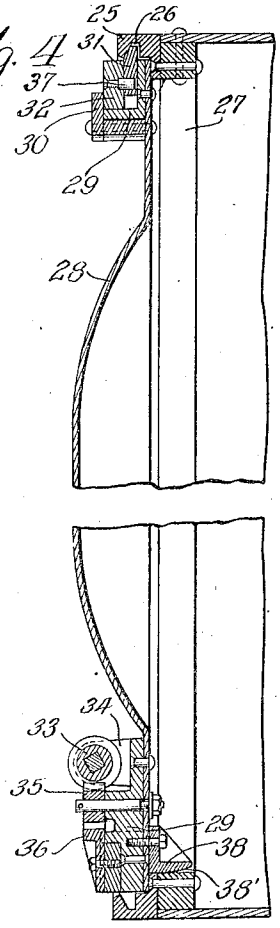


Fig. 4



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UNITED STATES PATENT OFFICE.

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LOCOMOTIVE FRONT END.

Application filed October 16, 1922. Serial No. 594,862.

To all whom it may concern:

Be it known that I, SAM F. KLOHS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Locomotive Front Ends, of which the following is a specification.

This invention relates to locomotive front ends and its object is to provide means of simple but strong and substantial construction whereby the door may be easily but securely locked tightly in place, at the front end of the smoke box, or unlocked and swung open to permit access to the smoke box for cleaning the flues or other purposes.

Another object of the invention is to provide means for locking the door to the smoke box around its entire periphery by a single operation, the means whereby this operation is effected being located in a convenient position adjacent the periphery of the door.

And a further object of the invention is to provide a plurality of locking means spaced apart at desired intervals around the periphery of the door and all adapted to be simultaneously actuated by a single operating means for locking or unlocking the door.

It has been the practice heretofore to secure the door on the front end of a locomotive by means of a plurality of bolts carried by a ring mounted in the end of the smoke box and arranged to enter holes provided for them in the door adjacent its periphery, and to receive nuts which are tightened thereon against the outer side of the door. To remove the door it is necessary, of course, to first remove all of the nuts which involves considerable labor and sometimes much trouble. Owing to the size and weight of the main door and the necessity of employing a crane or other apparatus for supporting it and removing it from its position at the end of the smoke box, and for replacing it, it has been customary heretofore to provide the main door with an inner door also secured by bolts to the main door and sometimes hinged to the main door; but the inner door is necessarily of less diameter than the smoke box and it does not ordinarily provide sufficient room for cleaning the flues or doing other necessary work in the smoke box. It is a make-shift to avoid the necessity for opening the main door because of its size and weight.

My invention has to do primarily with the means for locking the main door in place and the improved means permits the main door to be hung on hinges so that the door may be swung outward or inward on the hinges without necessitating the use of power apparatus for removing the door or for replacing it. And the locking means is adapted to secure the door as tightly in place as was possible heretofore with the bolts commonly employed, and even more tightly so that all chances of draft entering the smoke box through the door are entirely avoided.

In the accompanying drawings I have illustrated a selected embodiment of the invention which it will be understood is a typical application of the invention to a door of simple construction and referring thereto—

Fig. 1 is a front elevation, partly broken away showing a locomotive front end embodying the invention;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged sectional view on the line 3—3 of Fig. 1;

Fig. 4 illustrates one way of applying the invention to locomotive front ends now in use.

Referring to the drawings, 5 is the locomotive front end and 6 is a ring secured therein by bolts 7 or other suitable means. A part 6′ of this ring projects within the smoke box end of the locomotive and a part 6″ is located outside of and preferably flush with the smoke box end of the locomotive and is provided with a circumferential groove 8 having a bevelled outer side 8′ as shown more clearly in Fig. 3.

The door 9 is hinged to the boiler of the locomotive and it is provided with butts 10 engaged with butts 11 on the boiler by pintles 12.

Spaced apart at desired intervals around the periphery of the door are pockets 13 in which the locking blocks 14 are arranged to slide radially of the door. A ring 15 is seated on a flange 16 on the door and over the locking blocks 14, to hold the latter in place, and this ring is secured in place by brackets 17 and by flanges 19 on the hinged

butts 10 (Fig. 3). Each locking block is provided with a diagonal slot 20 which is inclined to the radius of the door and a bolt 21 seated in the locking ring 15 is arranged to operate in said slot. A worm 22 is mounted on the door, preferably adjacent the bottom thereof, and is arranged to operate a gear 23 which meshes with a rack 24 bolted to the locking ring 15.

It will be observed that the whole door at the front end of the locomotive is hinged to swing to open or to closed position and that all of the locking blocks are operated simultaneously and radially of the door by moving the ring rotatively in a clockwise or counter-clockwise direction through the medium of the worm which is operated by a wrench or other suitable tool applied to the end thereof. Thus the door is locked in place entirely around its periphery at the same time, the locking blocks being spaced as will be found effective for securing the desired tight joint to exclude draft.

The outer face of each locking block is bevelled to correspond with the bevel 8′ of the locking groove in the ring 6 so that as force is applied through the worm to rotate the locking ring forward to locking position, all of the locking blocks are thrust outward and their bevel faces engage and slide on the bevel face 8′ of the locking groove 8 to force the door inward to an air tight seat upon the ring 6.

My improved locking means can be applied to the front ends of locomotives now in use in the manner shown, for example, in Fig. 4. An auxiliary ring 25 corresponding substantially to the part 6″ of the ring 6 and having a locking groove 26 is bolted to the ring 27 which is found in the front end of locomotives now in use. The door 28 should be reduced in diameter to fit in the auxiliary ring 25 and an angle ring 29 is bolted to the door adjacent its periphery. A flanged ring 30 is bolted to the door to hold the locking blocks 31 and the locking ring 32 in place in the angle ring 29. The worm 33 is mounted in brackets 34 which may be formed integral with the angle ring 29, or may be made separate therefrom and bolted to the door; and the worm gear 35 and the rack 36 may also be mounted on the angle ring 29 or they may be otherwise supported on the door to operate in the manner heretofore described. The locking ring carries a plurality of pins 37 to operate in diagonal slots in the locking blocks as shown in Fig. 1.

My invention provides simple means for mounting the door at the front end of a locomotive and enables the door to be hinged to swing to open or to closed positions and to be locked tightly in place to prevent draft entering the smoke box. All of the locking blocks are simultaneously operated by rotating the locking ring forward or backward through the medium of a worm conveniently located adjacent the bottom of the door. And the construction is such that these radially sliding locking blocks will tightly clamp the door against the ring in the smoke box to provide an air tight joint. The locking means are easily operated, and by their use a door can be quickly unlocked and opened or closed and locked, and they enable the door to be hinged so that it is not necessary to remove it from the locomotive, whereby much time and labor is saved and access to the smoke box for cleaning flues or other purposes may be had more often than has been customary heretofore.

These doors are often quite heavy, sometimes weighing as much as a ton, and to support the door in locked position and relieve strain on the locking devices, I provide a support 38 which is bolted or otherwise made fast to the door adjacent its lower edge and adapted to engage or rest upon the part 6′ of the ring 6. This support is provided with a bevelled lower face 38′ to engage the ring, whereby the door is brought to proper closing position, even if the hinges are somewhat worn or the door sags somewhat thereon. This support insures that the door will line up properly when brought to closed position and make a flush and tight closure.

I claim:

1. A locomotive front end comprising a ring having a circumferential groove with a beveled side, a door having a locking block slidably mounted thereon, said block having a beveled edge and an inclined slot, a bolt movably mounted on said door and engaging said slot and means to cause movement of said bolt on said door to force said locking block into said groove with said beveled edge in contact with said beveled side.

2. A locomotive front end comprising a ring, a circumferential groove, a door having a plurality of locking blocks slidably mounted thereon and adapted to enter said groove, each of said blocks being provided with an inclined slot, a locking ring rotatably mounted on said door and provided with means entering said slots and means for rotating said locking ring to actuate the said locking blocks.

3. A locomotive front end comprising a ring, a circumferential groove, a door having a plurality of locking blocks slidably mounted thereon and adapted to enter said groove, each of said blocks being provided with an inclined slot, a locking ring rotatably mounted on said door and provided with means entering said slots, means for rotating said locking ring to actuate the said locking blocks, and means to hingedly support said door.

SAM F. KLOHS.